

toxicity). With this wide a range of known and unknown possibilities and unknowables, patients want help dealing with their perceptions of health with respect to toxic substances. In addition, medical professionals have specific occupational exposures of concern to them (nurses and pharmacists making up and administering cancer chemotherapeutic agents, x-ray personnel, operating room staff exposed to ethylene oxide sterilizing gas and anesthetics and so forth).

The history of modern medical science teaches epidemiologists that the first clue to previously unknown agent-host-environment relationships often comes from an alert and curious clinician who sees a case in a novel light and shares these thoughts with others who can help find additional examples and pursue the matter further. This process can be facilitated when those of us responsible for studying these problems in the public health community make ourselves available to share what information we have and help clinicians provide responses to patients who are anxious, ill or both. A call to a county health department is always in order. At the state level, such assistance is usually available from the departments of health (drinking water, hazardous waste, food and drug contaminants, pesticides, synthetic chemicals, carcinogens and teratogens, general environmental and occupational exposures, indoor air contaminants, metals and the like); agriculture (agricultural chemicals, toxic plants); industrial relations (occupational exposures and conditions); the air quality office (constituents of air pollution in various locations); the water quality office (constituents of ground and surface water pollution in various locations), and elsewhere. In California, the first call might best be directed to the new Tox-Info Center, a joint effort of the California Department of Health Services and the University of California at San Francisco (hotline 800-233-3360 is toll-free in California).

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Cancer In Situ of the Uterus and Cigarette Smoking

RECOMMENDATIONS FOR THE frequency of Papanicolaou tests have been based on the assumption that cancer of the uterine cervix is a venereally transmitted disease. Young women who are sexually active are advised to have a smear taken regularly. Over the past eight years several studies have raised the possibility that cigarette smoking is an independent risk factor for cervical cancer and is associated with a substantially higher risk than seen in women with multiple sexual partners.

In 1977 Winkelstein and co-workers pointed out the association seen between cigarette smoking and cancer of the uterine cervix in the data collected by the National Cancer Institute between 1969 and 1971. They suggested further research. Since that time, four carefully designed case-control studies testing this hypothesis have been completed. All have found that cigarette smoking is a risk factor for cancer of the uterine cervix independent of sexual activity. The risk was estimated at between 8 and 17 times greater, and has been

found for dysplasias of the cervix as well as in situ carcinoma. Winkelstein and associates reviewed the evidence again in 1984 and concluded that there likely was a causal connection between smoking and cervical neoplasia.

In 1985 Sasson and colleagues showed the presence of nicotine and cotinine in the vaginal fluid of cigarette smokers. The uterine cervix of a smoker is thus bathed in the metabolic products of cigarette smoking, much like the epithelial lining of the urinary bladder, but at higher concentrations.

Based on these data, physicians must view cigarette smoking as an independent risk factor when making recommendations about the frequency of Pap smears and should recommend careful surveillance regardless of a woman's sexual exposures.

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Milk-Borne Diseases

SINCE THE ADVENT at the turn of the century of pasteurization of nearly all market milk in this country, large-scale outbreaks of milk-borne diseases have been rare. Where disease problems still occur, these have been primarily associated with raw (unpasteurized) milk and, on rare occasions, with pasteurized milk. A vivid example of this latter situation was documented in Chicago in the summer of 1984 and again in March and April 1985 when thousands of consumers of pasteurized low-fat milk produced by a single dairy were infected with *Salmonella typhimurium*. The findings suggest that the pasteurized milk was inadvertently mixed with raw milk. This underscores the documented hazard of raw milk as a source of human pathogens. Virtually all other episodes of disease problems associated with "pasteurized" milk have been found, ultimately, to be due to postpasteurization contamination or inadequate pasteurization.

Listeriosis is a disease that has been associated with pasteurized and, more recently, in the Jalisco cheese outbreak in California, with inadequately pasteurized or postpasteurized contaminated milk. A possible explanation as to why *Listeria* can still be a problem with pasteurized milk is that leucocytes (which are in milk, especially from infected cows) may contain and thereby protect *Listeria* organisms from inactivation by routine pasteurization procedures. Obviously, if some *Listeria* can persist despite routine pasteurization procedures, raw milk must pose an even greater risk from this bacterial pathogen.

The major disease problems associated with milk in this country, however, are those of salmonellosis and campylobacteriosis; these continue to be linked to raw milk, including certified raw milk. In addition, other diseases linked to raw-milk ingestion include brucellosis, colibacillosis, corynebacteriosis, staphylococcal poisoning, streptococcal infection and tuberculosis. A newly recognized problem that has been